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A NEW GENUS AND TWO NEW SPECIES OF PANGONIINI (DIPTERA: TABANIDAE) OF ZOOGEOGRAPHIC INTEREST FROM SABAH, MALAYSIA

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Abstract.—A new genus of Pangoniini, ***Mesopangonius*** Burger, is described from Mount Kinabalu, Sabah, Malaysia. This is the first representative of this tribe known to occur in the Oriental Region. Although possibly derived from unspecialized Laurasian Pangoniini, its long, slender proboscis is characteristic of specialized genera of the tribe. Two new species, ***philipi*** and ***brackleyae*** are described in the genus, and a key is provided.

A recent small collection of Tabanidae from Mount Kinabalu, Sabah, Malaysia, by entomologists from the Smithsonian Institution, Washington, D.C., yielded two remarkable new species in an undescribed genus of the tribe Pangoniini. These are the first representatives of this tribe known from the Oriental Region, and are particularly interesting because they combine anatomical features of both generalized and specialized genera of Pangoniini.

Mesopangonius Burger, New Genus

Type species.—*Mesopangonius philipi* Burger, Sabah, MALAYSIA, by original designation.

Medium-sized (12–16 mm long) rather slender to moderately stout-bodied *Esenbeckia*-like species with well-developed ocelli; eyes bare with no color pattern; frontal index 2.5–3.0. Antennal bases closely approximated; flagellum subulate, bearing 8 annuli; basal annulation enlarged (Figs. 2C, 4C), about twice as long as high; apical annulation greatly elongated, about one-half length of remaining annulations combined. Proboscis slender, length 1.5–1.9 times height of head; labella long, slender and sclerotized (Figs. 2A, 4A); 2nd maxillary palpomere short and subcylindrical or somewhat flattened on outer surface, and bearing a shallow concavity. Legs long and slender, hind tibial spurs well-developed. Base of vein R_4 with a long spur, basal section of Cu bare or with 2–3 scattered setulae, Sc bare dorsally and ventrally. Female genitalia (Fig. 2E–G): ninth tergite entire, relatively broad and heavily sclerotized laterally, narrowed and weakly sclerotized medianly; tenth tergite divided medially; cerci rounded apically, length and width subequal; eighth sternite shield-shaped, very weakly sclerotized; apical lobes of the anterior gonapophyses deeply divided medially, about as long as wide, distance between lobes about two-thirds width of individual lobes; arms of the genital fork with wing-like expansions apically; distal ends of spermathecal ducts membranous, unexpanded.

Mesopangonius philipi Burger, New Species

Female (Fig. 1).—Length: body 12–14 mm; wing 13–15 mm. Front (Fig. 2B) yel-

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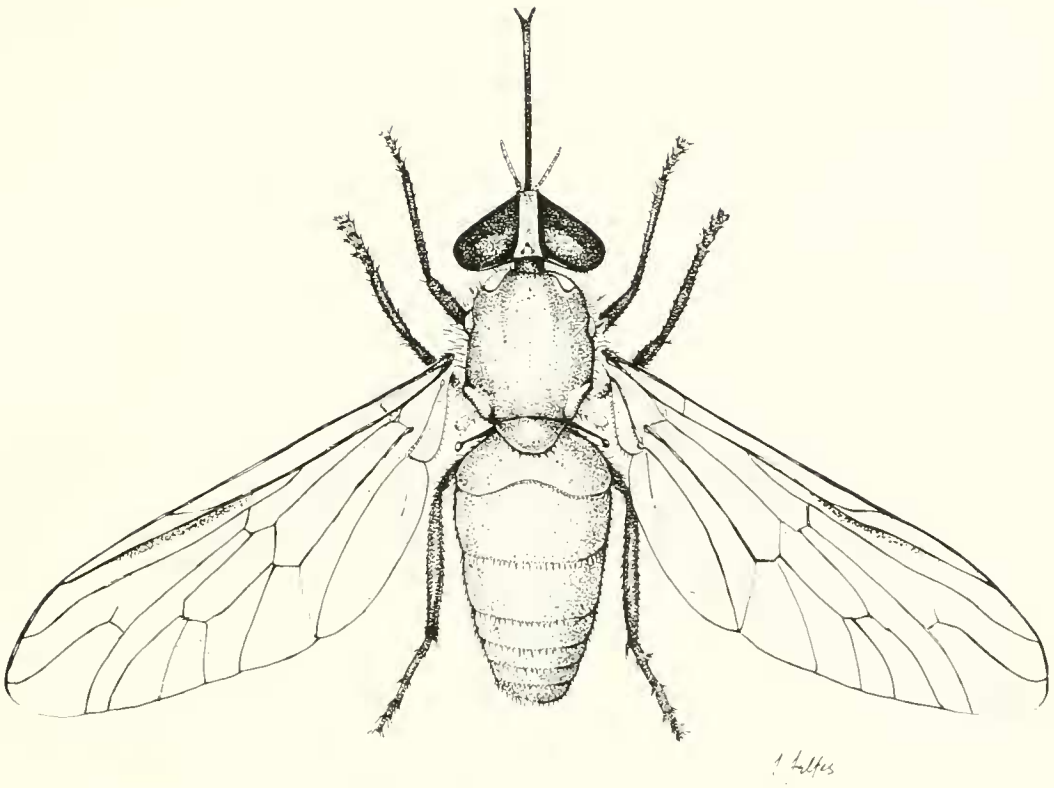

Fig. 1. *Mesopangonius philipi* sp. n., female. (8×)

lowish brown laterally, slightly diverging below, with broad dark brown pollinose ridge in middle extending from subcallus to vertex, bordered by an irregular row of semi-erect black setulae; frontal index 2.8–3.2, divergence index 1.2–1.3. Ocelli large and prominent, borne on a conspicuous tubercle; vertex depressed below upper margin of head. Subcallus, gena and face brown pollinose, gena sparsely clothed with brown hairs; face moderately produced, upper lateral surface with patch of brown hairs; beard rather sparse, with brown hairs anteriorly, pale yellowish ones posteriorly. Antenna (Fig. 2C) yellow brown, slightly darker apically; bases closely approximated, distance between them distinctly less than width of scape; scape and pedicel yellowish brown pollinose, black setose; flagellum subulate, with 8 annuli; basal annulation enlarged, about one-third broader than succeeding annulation and bearing a dense tuft of black setulae at apex of upper margin, apical annulation three times length of penultimate annulation. Proboscis slender (Fig. 2A), length 1.7–1.9 times head height; labella long and slender, sclerotized. Maxillary palpus (Fig. 2D) with apical palpomere short and slender, subcylindrical, length less than one-fifth that of proboscis, bearing long, black semi-erect setae on outer surface, basal palpomere slightly broader than apical segment, bearing long, black semi-erect setae. Eye bare, unpatterned (relaxed), rather coarsely faceted.

Mesonotum light brown, bearing semi-erect brown hairs, except pale yellowish white ones anteriorly near the head; notopleural lobe concolorous with mesonotum; scutellum slightly paler; pleuron paler yellowish brown, bearing pale yellow hairs, except dark brown ones posteriorly on mesan-

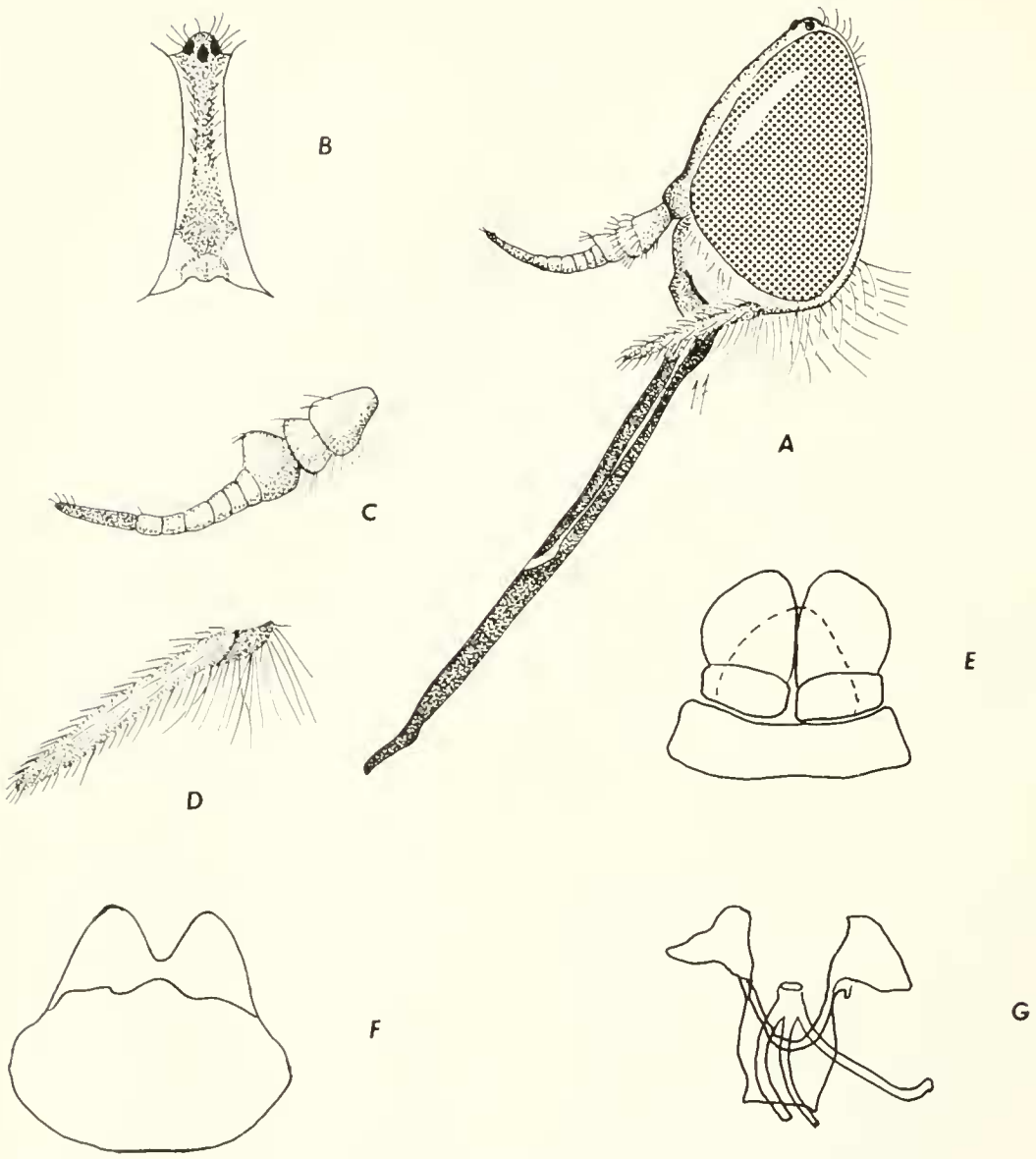

Fig. 2. *Mesopangonius philipi* sp. n., female. A, Profile of head. (16×) B, Frontal view of head. (16×) C, Antenna. (32×) D, Maxillary palpus. (32×) E, Eighth, 9th tergites, cerci, dorsal view. (60×) F, Eighth sternum and anterior gonapophyses. (60×) G, Genital fork and caudal ends of spermathecal ducts. (90×)

episternum. Legs slender, elongate, unicolorous pale yellowish brown, bearing mixed pale yellowish and dark brown hairs; apical spurs on hind tibia nearly as long as those on mid-tibia. Wing lightly brown tinted throughout; R_4 with long spur; cells r_5 and m_3 open to wing margin. Halter light brown.

Abdomen pale greenish brown, with some yellowish tones intermixed but without definite pattern; tergite 1 slightly paler; tergites 5–7 slightly darker; all tergites bearing predominantly dark hairs, with some pale yellowish ones intermixed anteriorly and laterally; ventral surface concolorous.

Holotype ♀, MALAYSIA: Sabah; Kina-

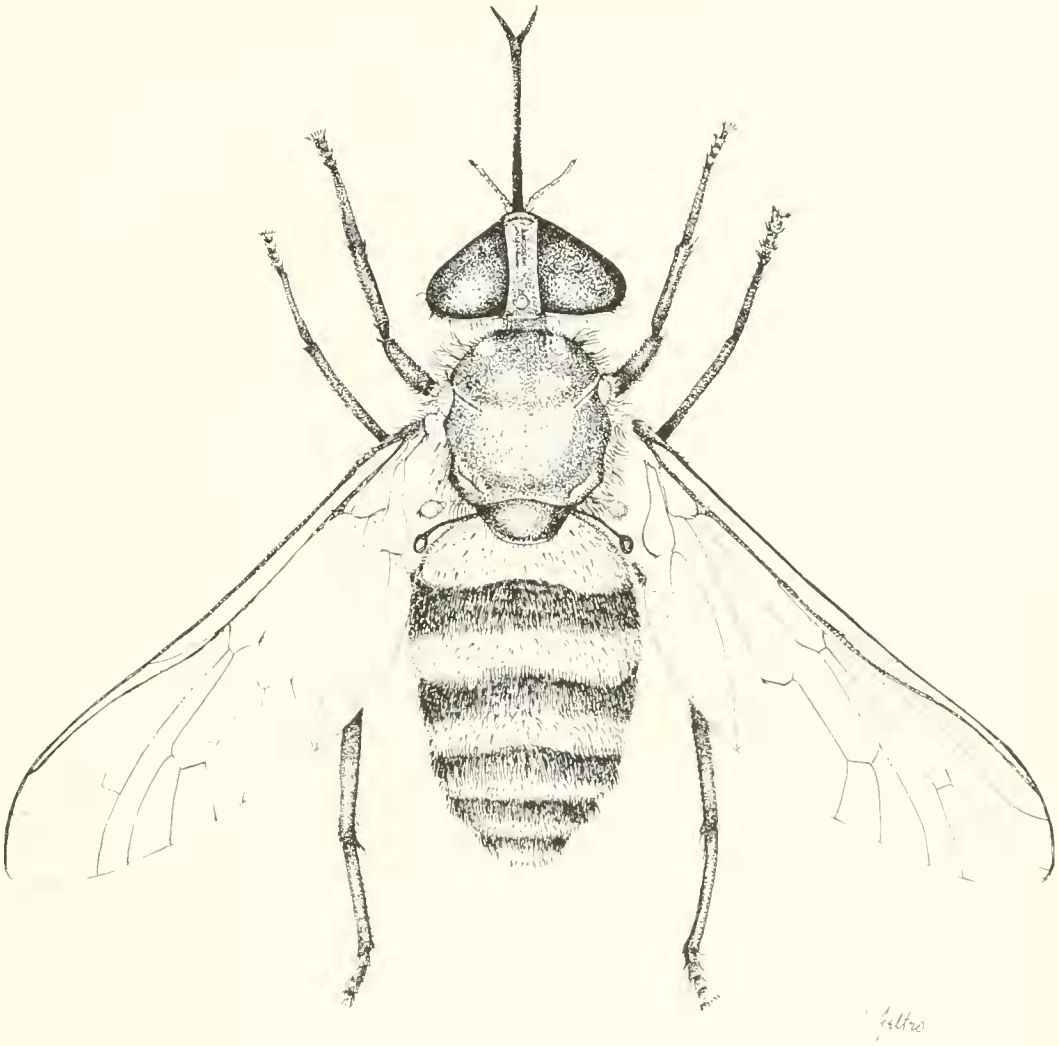

Fig. 3. *Mesopangonius brackleyae* sp. n., female. (8×)

balu National Park, Headquarters area, el. 1560 m, 9 Sept. 1983, G. F. Hevel & W. E. Steiner (National Museum of Natural History, Washington, D.C. (NMNH)).

Paratypes, MALAYSIA: 2 ♀, 8, 13 Sept. 1983. Same data as holotype (NMNH; J. F. Burger Collection).

I take great pleasure in naming this species for the late Cornelius Becker Philip, indefatigable student of Tabanidae, who contributed much to our knowledge of Oriental Tabanidae.

Mesopangonius brackleyae Burger, New Species

Holotype female.—Length: body 15.6 mm; wing 16 mm (Fig. 3). Front (Fig. 4B) dark brown pollinose, slightly diverging below, middle with a poorly-defined raised ridge from subcallus to vertex, bearing an irregular median subshining black area and bordered by an irregular row of black setulae; frontal index 2.5, index of divergence 1.2. Ocelli large and prominent, borne on a

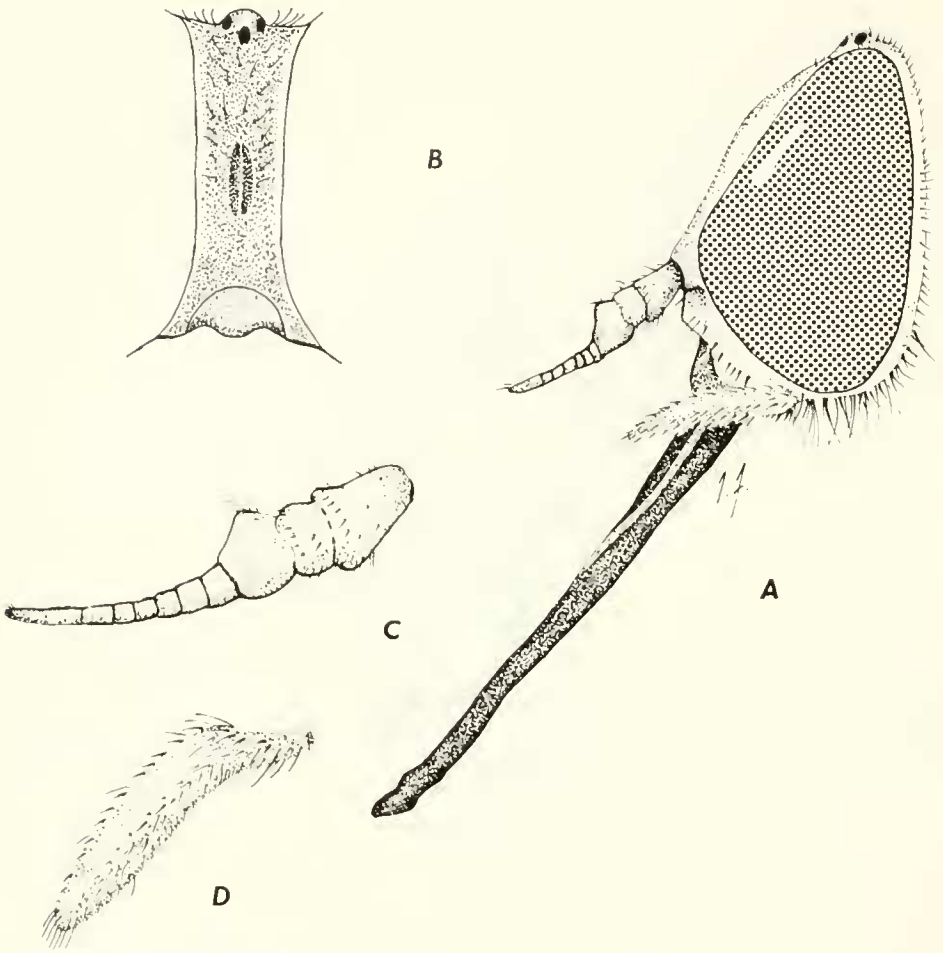

Fig. 4. *Mesopangonius brackleyae* sp. n., female. A, Profile of head. (16×) B, Frontal view of head. (16×) C, Antenna. (32×) D, Maxillary palpus. (32×)

conspicuous tubercle at vertex. Subcallus concolorous with front. Gena and face gray pollinose, except face shining dark brown along lower margin; face moderately produced, dorsolateral surfaces with patch of dark brown hairs; beard mostly pale yellowish, except dark brown hairs anteriorly. Scape and pedicel of antenna yellowish gray pollinose, antennal bases closely approximated, distance between them distinctly less than width of scape; flagellum subulate (Fig. 4C), with 8 annuli, yellowish brown, apical annulation dusky brown; basal annulation conspicuously enlarged, twice as broad as second annulation, bearing 1–2 setulae on upper surface; apical annulation 2.5 times length of penultimate annulation. Proboscis slender (Fig. 4A), length 1.5 times head height, labella long and slender, sclerotized. Maxillary palpus (Fig. 4D) short, apical palpomere brown, distinctly flattened, length one-fourth that of proboscis, bearing long black setae on outer surface and narrow bare median concavity. Eye bare, unpatterned (relaxed), relatively coarsely faceted.

Mesonotum and scutellum subshining dark brown, densely clothed with semi-erect yellowish hairs; postpronotal lobe reddish gray pollinose; notopleural lobe reddish; pleuron grayish pollinose, except mesanepisternum and anterior half of katepisternum with blackish tones, densely yellow pilose.

Legs slender, elongate; coxa and femur dark brown, black pilose, except apex of femur paler; tibia pale brown, bearing yellow hairs; hind tibial spurs well-developed, subequal to mid-tibial spurs; tarsus basally concolorous with tibiae, darker brown apically. Wing light brownish tinted on anterior half, subhyaline posteriorly; R_4 with long spur; cells r_5 and m_3 open to wing margin. Halter pale brown.

Tergite 1 of abdomen entirely pale yellowish brown, pale yellow pilose; tergites 2–4 dark brown on basal three-fourths, contrastingly paler brown on apical fourth, the dark and light areas bearing black and pale yellow hairs respectively; tergites 5–7 dark brown, black-haired, with conspicuous yellow-haired posterior margins (Fig. 3); ventral surface of abdomen with similar pattern as dorsum, except sternite 2 predominantly light brown, and only basal halves of sternites 3–4 dark brown.

Holotype ♀, MALAYSIA: Sabah; Kinabalu National Park, Headquarters area, el. 1560 m, 9 Sept. 1983, G. F. Hevel & W. E. Steiner (National Museum of Natural History, Washington, D.C.).

I take pleasure in naming this striking species for my good friend and colleague, Frances Brackley, a specialist of the Orchidaceae, who first sparked my interest in dipterous pollinators of alpine plants.

The following key will separate the species of *Mesopangonius* described above:

1. Abdominal tergites 2–5 dark brown, with paler brown apices and complete yellow-haired incisures; all femora dark brown, contrasting with light brown tibiae; apical palpomere of maxillary palpus somewhat flattened, outer surface with a bare, shallow concavity . . . *brackleyae*, n. sp.
– Abdominal tergites light brown throughout, without strongly contrasting markings or hairs; all femora and tibiae concolorous light brown; apical palpomere of maxillary palpus narrow and subcylindrical, lacking a bare concavity on the outer surface . . . . . *philipi*, n. sp.

Discussion

Mesopangonius resembles *Esenbeckia* Rondani, a predominantly Neotropical genus, but differs in having the basal annulations of the flagellum not forming a partially-fused, enlarged plate, a more slender proboscis with very narrow, elongate labella, and with cell r_5 of the wing widely open to the wing margin. The female terminalia also are similar to *Esenbeckia*, differing primarily in the broader ninth tergite (Fig. 2E), the more rounded cercus, and the more widely separated apical lobes of the anterior gonapophyses (Fig. 2F).

Mackerras (1955) subdivided the genera of Pangoniini into generalized (Group 1) and specialized (Group 2) moieties. Those genera considered to be more generalized have the r_5 cell of the wing open, proboscis stout and subequal to head height, the labella distinctly enlarged and unsclerotized, and the body usually slender or with the abdomen parallel-sided. Most of the genera included have a south or north temperate relict distribution in montane or desert environments. Fourteen of 18 genera in Mackerras' Group 1 occur in coastal or desert North America (5), the mountains of Chile and Argentina (5), and in Australia (4). Two genera occur in Japan, and one each in Brazil and southern Africa.

Genera of Pangoniini considered to be specialized have cell r_5 closed, or strongly narrowed apically, proboscis slender, as long as to much longer than head height, labella narrow, sclerotized, and sometimes very long, and the body usually stoutly-built. These genera have a predominantly southern Palearctic, amphi-Mediterranean (*Pangonius*), or a new world tropical and subtropical (*Esenbeckia*) distribution. Mackerras considered *Austroplex* Mackerras, from Australia, to be a link between the two groups because of its basally expanded antennal flagellum, but most of its features can be considered generalized.

Mesopangonius also has a preponderance of primitive features, eyes bare and coarsely faceted, cell r_5 of the wing open, relatively slender body (somewhat stouter in *brackleyae*), basal flagellar annulations not consolidated into an enlarged plate, relatively narrow, unspecialized maxillary palpus, the

long, slender legs, and the broad and undivided ninth tergite. The principal specialized features are the long, slender proboscis, the long, narrow, sclerotized labella, and the deeply divided and relatively widely-separated apical lobes of the anterior gonapophyses. The preponderance of primitive features suggests that *Mesopangonius* is closer to the generalized group of genera, and that the elongate, narrow proboscis and labella may be an adaptation to a particular trophic niche. *Mesopangonius* also occurs in a montane "temperate" area on Mount Kinabalu at the northern end of the Crocker Range in Sabah, an environment similar to that where some genera of Pangoniini in Mackerras' Group 1 occur.

Since Borneo is a continental island associated with the Laurasian plate, *Mesopangonius* may be derived from a generalized Laurasian pangoniine stock. Genera of Pangoniini presently known from Eurasia, other than *Mesopangonius,* are *Stonemyia* Brennan (Japan, Southwestern Asia [Caucasus], and possibly China), *Nagatomyia* Murdoch & Takahasi (Japan), and *Pangonius* Latreille (amphi-Mediterranean). *Mesopangonius* differs most conspicuously from *Stonemyia* in having a more slender body, a longer, more slender antennal flagellum, with only the basal annulation enlarged and a much longer apical annulation, a longer, more slender proboscis with a long, narrow, sclerotized labella, shorter palpus, legs longer and more slender, ventral surface of scutellum without bristles, R_4 of the wing with a long spur, the larger, deeply-divided lobes of the anterior gonapophyses, and the caudal ends of the spermathecal ducts membranous and delicate (Fig. 2G). It shares few features with *Nagatomyia* other than the presence of ocelli, the slender body and the open cell r_5. *Mesopangonius* differs from *Pangonius* in having a more slender body, ocelli larger and more prominent, basal annulation of flagellum broader, apical palpomere shorter relative to proboscis length, and with the outer concavity, when present, very shallow, the legs more slender and elongate, cell r_5 of the wing open, and the lobes of the anterior gonapophyses larger and more deeply-divided medianly.

Mesopangonius bears little resemblance to generalized Pangoniini associated with the Australian plate, as one might expect from tectonic evidence. *Ectenopsis* Macquart has coarse eye facets and a narrow cylindrical apical palpomere, but otherwise has little in common with *Mesopangonius.* Some species of *Fidena* Walker, a genus with specialized features in the Scionini that has radiated extensively in the Neotropical Region, have a proboscis configuration like that of *Mesopangonius,* but otherwise are quite distinct.

The only other representatives of the Pangoniinae known from the Oriental Region are in the Philolichini (*Philoliche* Wiedemann). Of these, only species in the subgenus *Buplex* Austen of *Philoliche* share even a superficial resemblance to *Mesopangonius,* and then only because they have ocelli, and some species have a narrow, elongate proboscis. However, they are presently restricted to southern Africa. The Oriental species of *Philoliche* lack ocelli, have strongly produced faces, closed wing cells, lobes of the anterior gonapophyses more widely separated, and other features that clearly exclude them from close relationship with *Mesopangonius.*

It is remarkable that *Mesopangonius* remained uncollected and unknown for so long. Its chance discovery suggests that other representatives of the Pangoniini possibly may be found in remaining "temperate islands" within tropical Asia, given sufficient patience and collecting, before such refuges disappear.

Acknowledgments

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